

UNIX™ System Program

DEC PDP-11/34, 40, 45, 70

The UNIX system is a multi-programming, time-sharing operating system that effectively converts the DEC PDP-11/34, 40, 45, 70 into a small-scale computer center supporting up to 40 users.

The UNIX system offers a number of features seldom found even in larger operating systems.

The UNIX system provides a hierarchical file system with full protection, demountable volumes, device independence, and programming simplicity. Any program or group of programs can be run asynchronously in foreground or background without change.

There are no distinctions in capability or usage between user programs and system programs, except those imposed by file protection. Input/output buffering, main storage allocation, and allocation of disk storage are automatic and invisible. Programs are automatically re-entrant and shareable.

The UNIX system's packaged programs include: a text editor, a programmable command language interpreter, compilers for several languages, assembler, link editor, debuggers, document formatters (with mathematical formula capability), a wide variety of text processing programs, a sorting utility, status inquiry, inter-user communication, administrative and maintenance programs, and games (including chess). Source code is included (except for games).

UNIX programs can be and usually are designed to work together. The

output of one program can be directed into the input of another by a single command line character. Large-scale computing processes can be composed by combining existing small programs, rather than by developing completely new programs.

Published references:

"The UNIX Time-Sharing System," Ritchie and Thompson, **Communications of ACM**, Vol. 17, No. 7, pgs. 365-375, July 1974.

Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:

Documents for Use with the UNIX Time-Sharing System,

Sixth Edition, Bell Laboratories. (\$30)

UNIX Programmer's Manual,

Sixth Edition, Bell Laboratories. (\$30)

UNIX Summary,

Bell Laboratories, August 1975

Hardware requirements:

DEC PDP-11/34, 40, 45, 70

Programming language:

C Language

License fees:

\$20,000 (first central processing unit)
\$ 6,700 (each additional CPU)

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For more information, contact the Technology Licensing Manager, AT&T, P.O. Box, 25000, Greensboro, North Carolina 27420 or call (919) 697-6530



MINI-UNIX™ System Program

DEC PDP-11/10,20,34,40

The MINI-UNIX operating system is essentially a scaled-down version of the UNIX time-sharing operating system designed to run on the smaller-scale DEC PDP-11 computers.

The MINI-UNIX operating system is a general-purpose, time-sharing system for the Digital Equipment Corporation PDP-11/10,20,34 and 40 computers. Basically a scaled-down version of the standard UNIX operating system, the MINI-UNIX system also offers a hierarchical file system with protection, demountable volumes, device independence, and programming simplicity. Any program or group of programs can be run asynchronously in foreground or background without change. There are no distinctions in capability or usage between user programs and system programs, except those imposed by file protection. Input/output buffering, memory allocation, and allocation of disk storage are automatic and invisible.

The MINI-UNIX system's packaged programs include: a text editor, a programmable command language interpreter, compilers for several languages, assembler, link editor, debuggers, document formatters (with mathematical formula capability) for terminals, a variety of text processing programs, a sorting utility, status inquiry, inter-user communication, administrative and maintenance programs, and games (including chess).

In short, the MINI-UNIX system can provide almost all the capabilities of the standard UNIX system. The MINI-

UNIX system can handle up to four users and 13 concurrent processes.

SEE ALSO: **UNIX Operating System:**

Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:

"The MINI-UNIX System,"

Lycklama, H., Bell Laboratories,
January 3, 1977.

Documents for Use with the MINI-UNIX Time-Sharing System,

Sixth Edition, Bell Laboratories. (\$30)

UNIX Programmer's Manual,

Sixth Edition, Bell Laboratories. (\$30)

MINI-UNIX Summary,

Bell Laboratories, January 1977.

Hardware requirements:

DEC PDP 11/10,20,34,40

Programming language:

C Language

License fees:

\$12,000 (first central processing unit)
\$ 4,000 (each additional CPU)

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PWB/UNIX™ System Program

System Programs
DEC PDP-11/45, 70

The PROGRAMMER'S WORKBENCH (PWB/UNIX) is a specialized computing facility dedicated to satisfying the needs of developers of computer programs. It is "human-engineered" for productivity and efficiency gains. PWB is an expanded version of the UNIX operating system for DEC PDP series mini-computers.

In addition to the features of the UNIX system, the PWB option provides a convenient working environment and a uniform set of programming tools for a diverse group of programming projects. PWB/UNIX software is appropriate for both small- and large-scale application development projects.

PWB/UNIX software provides a "word processing" system with editing, text formatting, spelling and typographical error-detection facilities. The document preparation and text-processing facilities of the PWB/UNIX system include commands that automatically control pagination, style of paragraphs, line justification, hyphenation, multi-column pages, footnote placement, generation of marginal revision bars, generation of tables of contents, etc. These capabilities are useful for specialized documents such as program run books, or for general documents such as letters, memoranda, legal briefs, etc.

The Remote Job Entry (RJE) facility provides for the submission and retrieval of jobs from an IBM host system (e.g., a System/360 or System/370 computer using HASP, ASP, or JES2). To the host system, RJE appears to be a card reader/punch and line printer station.

At the request of a PWB/UNIX system user, RJE gathers the job control statements to be sent to the host system and, subsequently, retrieves from the host the resulting output,

places it in a convenient PWB/UNIX file for later perusal, and notifies the user of the output's arrival.

Another feature of the PWB/UNIX operating system is the Source Code Control System (SCCS), an integrated set of commands designed to help software development projects in the control of changes to source code and to files of text (e.g., manuals). It provides facilities for updating, for storing, and for retrieving, by version number or date, any version previously stored. Using SCCS, records on who, why, and when may be kept on each version change of source code modules or documents. Storage efficiency of these multiple historical versions is achieved through SCCS's scheme of storing only the revisions to prior versions.

SCCS is designed to solve most of the source code and documentation control problems that software development projects encounter when customer support, system testing and development are all proceeding simultaneously.

SEE ALSO: UNIX System

Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:

PWB/UNIX—Overview and Synopsis of Facilities,

June, 1977, Bell Laboratories. (available free of charge)

PWB UNIX User's Manual

Edition 1.0. (\$40)

Documents for the PWB/UNIX Time-Sharing System,

Edition 1.0. (\$40)

Hardware requirements:

DEC PDP 11/45 and 70

Programming language:

C Language

License fees:

\$30,000 (first central processing unit)
\$10,000 (each additional CPU)

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For more information, contact the Technology Licensing Manager, AT&T, P.O. Box, 25000, Greensboro, North Carolina 27420 or call (919) 697-6530



UNIX™/V7 System Program

DEC PDP-11/45,70

The UNIX Time-Sharing System, Seventh Edition, is a multi-programming, time-sharing operating system that runs on a DEC PDP-11/45 or 11/70. It can support up to 40 users.

UNIX/V7 is an enhanced version of the UNIX System, Sixth Edition, with additional features. It includes a new expanded file system with addressing capability of up to 2^{30} bytes per file. The code of the operating system and most utilities has been revised to minimize its dependence on particular hardware, thus advancing its portability. C Language has been extended and there is a new FORTRAN 77 compiler which is compatible with C Language at the object level. The system contains a completely new shell program (command language interpreter) which supports string variables, trap handling, structured programming, user profiles, settable search path and multilevel file name generation. There is also a substantial number of new utilities for program development and text processing, as well as a capability for machine-to-machine spooled file transfers.

The UNIX System's packaged programs include: a text editor, a spelling checker, assembler, link editor, debuggers, report generator, document formatters, text processing programs, sorting utility, status inquiry and administrative and maintenance programs. Also, the phototypesetter interface software, which was formerly a separate package, is now included.

The UNIX System, Seventh Edition,

is a highly efficient and extremely capable time-sharing operating system.

SEE ALSO: **UNIX** Operating System.

Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:

UNIX Programmer's Manual,

Seventh Edition, Vol. 1, January, 1979, Bell Laboratories. (\$40)

UNIX Programmer's Manual,

Seventh Edition, Vols. 2A and 2B, January, 1979. (\$60)

UNIX Summary,

Bell Laboratories.

Hardware requirements:

DEC PDP-11/45, 70

Programming languages:

C Language, FORTRAN 77

License fees:

\$28,000 (first central processing unit)

\$ 9,400 (each additional CPU)

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For more information, contact the Software Licensing Manager, Western Electric, P.O. Box 25000, Greensboro, North Carolina 27420, or call (919) 697-6530.



UNIX™/32V System Program

DEC-VAX-11/780

The UNIX/32V system is a multi-programming, time-sharing operating system designed for the DEC-VAX-11/780 hardware. The UNIX/32V system is an enhanced version of the UNIX-V7 operating system that executes on medium-to large-scale computers. It can support 48+ concurrent users.

UNIX/32V is an enhanced UNIX Version 7 modified to run on and utilize the features of the VAX-11/780. Like UNIX/V7, UNIX/32V provides larger file capacity. A "partial swapping" technique is implemented which allows larger application programs and increases overall processing speed.

The UNIX/32V system operates on a 32-bit machine instruction set with added programming flexibility. It is upward compatible with UNIX/V7. The FORTRAN-77 is also supported with this version.

The UNIX/32V system's package programs include: a text editor, a programmable command language, compilers for several languages, assembler, linkage editor, document formatters, debuggers, text processing programs, status inquiry, inter-user communication, and administrative and maintenance programs. The Photo-typesetter programs are also provided. Source code is provided for all programs.

The UNIX/32V system is efficient and flexible, resulting in user satisfaction and productivity gains.

SEE ALSO: **UNIX, UNIX-V7 Operating Systems.**

Available from Bell Labs Computing Information Service, Murray Hill, N.J. 07974:

UNIX /32V Time-Sharing System:

UNIX Programmer's Manual, Version 1.0, Vol. 1. (\$40)

UNIX Programmer's Manual, Seventh Edition

Vols. 2A and 2B. (\$60)

UNIX V32 Summary

Hardware requirements:

DEC-VAX-11/780

Programming languages:

C Language, FORTRAN 77

License fees:

\$40,000 (first central processing unit)
\$15,000 (each additional CPU)

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UNIX[®] SYSTEM III SYSTEM PROGRAM

DEC[®] PDP 11/23, 34, 44, 45,
70, VAX 11/780

UNIX System III combines the features of the UNIX System, Seventh Edition (V7), and the PWB/UNIX System with several major enhancements. It provides a functional and efficient time sharing processing capability for up to 48 users.

UNIX System III - V7 + PWB + EXTRAS

The V7 features include major items such as the large file system (addressable to one billion bytes), the phototypesetter software, the shell program, and the capability for machine-to-machine spooled file transfers.

The PWB (Programmers Work Bench) features are designed to particularly satisfy the needs of developers of computer programs. These features include document preparation systems and text formatting capabilities, as well as a Remote Job Entry (RJE) facility and the Source Code Control System (SCCS) for efficient storage and retrieval of each previously modified version of source code modules or text.

Major enhancements include:

- Support for down-loading certain I/O functions to the DEC KMC-11 microprocessor. This allows implementation of a virtual protocol machine, a new multi-leaving IBM Remote Job Entry (RJE) system, and lower overhead DMA processing for the DZ11 asynchronous multiplexor.
- A new special file type called a FIFO (First In/First Out). FIFO's behave like pipes in UNIX Systems, but have names and can be used to pass data between multiple, non-related processes.

- Synchronous terminal interface driver for TELETYPE[®] Model 40/4 terminals.
- A parallel communication link driver which provides networking of up to 16 computers through the DEC PCL11-B.
- Enhanced C-compiler, text processing software, Source Code Control System, and graphics capabilities.
- Expanded terminal options.

SEE ALSO: UNIX, UNIX/V7, and PWB/UNIX System Programs

Documents available to licensees of UNIX System III from Western Electric, Patent Licensing Organization, P.O. Box 25000, Greensboro, N.C. 27420:

Summary Of UNIX System III

UNIX User's Manual, Release 3.0 Volume 1, Bell Laboratories, June 1980 (\$40)

Programmer's Manual For UNIX System III, Volume 2A and 2B, October 1981 (\$40 each)

Hardware Requirements:

DEC VAX 11/780, PDP 11/23, 34, 44, 45, 70

Programming Languages:

C Language, Fortran 77, SNOBOL, Assembler

License Fees:

\$43,000 first central processing unit (CPU)

\$16,000 each additional CPU

For more information, contact the Technology Licensing Manager, AT&T, P.O. Box 25000, Greensboro, North Carolina 27420, or call (919) 697-6530.

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